

chronic diseases that impose limitations on activities, older persons do not have to have a substantial reduction in physical fitness with aging. Many cases of physical decline with aging are simply a matter of deconditioning. Furthermore, 65% of elderly persons living in the community describe their own health as excellent, very good, or good compared with others their age. Several measures can be taken to prevent dependency in the elderly, and the elderly should be targeted for preventive programs. Although some studies have questioned the influence of good health practices on health status and disability in the elderly, recent studies have affirmed the value of basic health practices for the elderly. The findings suggest that important health practices for elderly persons are refraining from smoking (ever or currently), maintaining weight control, engaging in some form of physical activity such as walking or gardening, getting seven to eight hours of sleep a night, and maintaining social networks. More attention also needs to be given to a significant measure of a loss of independence—nursing home placement. Some possible modifiable risk factors for nursing home admissions include functional impairment in activities of daily living, household isolation, a lack of social support, falls, and cognitive impairment. Finally, iatrogenic illnesses contribute to a lot of disability in the elderly and are probably the most preventable diseases in old age. The most common types are inappropriate medications, nosocomial infections, and the overuse of therapeutically imposed bed rest.

Because there are many factors in preventing disability in the elderly that go beyond the traditional disease-specific preventive approach, a multifunctional geriatric assessment is crucial in evaluating the elderly to determine what are the important problems and also to develop the necessary intervention plan to keep the elderly functioning as independently as possible in the community for as long as possible.

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#### REFERENCES

- Kane RL, Kane RA, Arnold SB: Prevention and the elderly: Risk factors. *Health Serv Res* 1985 Feb (pt 2); 19:945-1006
- Kaplan GA, Seeman TE, Cohen RD, et al: Mortality among elderly in the Alameda County study: Behavioral and demographic risk factors. *Am J Public Health* 1987 Mar; 77:307-312
- Katz S, Brandt LG, Branson MH, et al: Active life expectancy. *N Engl J Med* 1983 Nov 13; 309:1218-1224
- Pinholt EM, Kroenke K, Hanley JF, et al: Functional assessment of the elderly: A comparison of standard instruments with clinical judgment. *Arch Intern Med* 1987 Mar; 147:484-488

## Chemical Contamination of Fish as an Emerging Environmental Health Concern

IN CALIFORNIA and other states, concern about the contamination of fish by organic and inorganic chemicals is increasing. In the past three years, the California Department of Health Services has evaluated various fish and game contamination situations and issued health advisories for persons consuming fish taken from certain locations where elevated levels of chemical contaminants are found in fish. The chemicals involved include methylmercury, selenium, DDT, and polychlorinated biphenyls (PCBs). Exposure to some of these chemical substances in the regular daily diet of the general population in this country is unavoidable because virtually all fish have some body burden of the above substances. While clinical illness is not certain to result from eating fish at the higher levels of contamination found, increased regular ingestion could increase the health risk. The health advisories

are consumption guidelines incorporating a safety factor, and they specifically consider the greater sensitivity of population subgroups such as pregnant women and young children. They are also specific for certain species of fish found in certain locations. The purpose of these guidelines is to minimize excessive exposure to environmental contaminants.

Some of the specific locations in California for which advisories have been issued are as follows: the Grassland area in Merced County; Harbor Park Lake in Los Angeles County; Lake Nacimiento in San Luis Obispo County; the San Francisco Bay delta region; Clear Lake in Lake County; Salton Sea in Imperial and Riverside counties; southern California, including Santa Monica Bay, Palos Verdes Peninsula, and the Los Angeles-Long Beach Harbor area; Lake Berryessa in Napa County; and Lake Herman in Solano County.

Methylmercury affects the nervous system, with paresthesia as the earliest symptom of poisoning, and it can harm a fetus. Poisoning episodes have resulted from the ingestion of methylmercury-contaminated fish in Japan and contaminated bread in Iraq. A minimal level of clinical effect has been established at 200 ng mercury per ml blood. Selenium at high intake levels can produce gastrointestinal disturbances, a loss of hair and nails, skin lesions, nervous system effects, and, based on animal data, may cause adverse reproductive and developmental effects. Human toxicity has resulted in the United States from overdosing with a selenium supplement containing a dose level many times above that indicated on the label and in China from ingesting contaminated food crops where selenium from stony coal reached the soil and was taken up by the plants. Selenium intoxication from fish consumption has not been documented. The primary health concern relating to DDT and PCBs is the potential carcinogenic risk. Low birth weights and smaller head circumferences have been observed in newborn infants whose mothers consumed moderate quantities of PCB-contaminated fish from Lake Michigan.

Persons who sport fish should be informed of the health advisories that are published in the state sport fishing regulations obtainable where fishing licenses are sold or by contacting local health officials. Clinicians should also be aware of early clinical manifestations associated with high exposure to these chemical substances and the biologic monitoring methods used for detecting these substances for confirming exposure.

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#### REFERENCES

- Clarkson T, Cranmer J, Sivulka DJ, et al: Mercury health effects update: Health issue assessment final report, EPA report No. 600/8-84/019F. Research Triangle Park, NC, Environmental Protection Agency, Aug 1984
- Fein GG, Jacobson JL, Jacobson SW, et al: Prenatal exposure to polychlorinated biphenyls: Effects on birth size and gestational age. *J Pediatr* 1984 Aug; 105:315-320
- California Sport Fishing Regulations. Sacramento, Calif Fish and Game Commission, 1987
- Toxicity with superpotent selenium. *FDA Drug Bull* 1984 Aug; 14:19

## Ozone Air Pollution

OZONE is a reactive oxidizing gas formed in ambient air by the action of sunlight on automobile exhaust and some industrial emissions. Although control measures undertaken since the passage of the Clean Air Act in 1970 have considerably decreased ozone concentrations to which people are exposed, more than 60 urban areas violate the federal hourly standard of 0.12 ppm. The Los Angeles basin, for example, exceeded

this level on 148 days in 1986. Failure to meet this health-based standard has potential clinical implications, as summarized below.

The effects of acute exposure to ambient ozone include cough, chest tightness, substernal pain on inspiration, dyspnea, and a decreased ability to perform sustained exercise. Spirometric tests of people exposed in controlled laboratory settings show a significantly increased airway resistance and bronchial hyperreactivity and decreased forced expiratory volumes at concentrations as low as 0.12 ppm. Persons at risk from acute exposure to such low levels of ozone include adults and children involved in vigorous outdoor activity, such as heavy manual labor, jogging, or cycling. Physical exertion per se is not considered to enhance susceptibility to the effects of a given dose of ozone; rather, increased ventilation augments the effective dose delivered to the lungs. People at rest or doing light exercise, however, do not generally have respiratory symptoms or significant changes in lung function until ozone concentrations approach 0.3 ppm. Although epidemiologic studies indicate that even low concentrations may provoke asthmatic attacks, controlled exposure studies suggest that persons with preexisting pulmonary disease are not remarkably more sensitive to ozone's bronchoconstrictive effects than healthy people.

Children appear to experience pulmonary function decrements of a similar magnitude to those seen in adults, yet do not report increased respiratory symptoms to the same extent, suggesting that they may be less aware of somatic warnings to

curtail exposure. This is of interest because stage 1 smog alerts, in which schools are advised to restrict outdoor activities, go into effect when ambient ozone concentrations reach 0.2 ppm, even though symptoms and signs of toxicity are observable in exercising persons at lower concentrations. Furthermore, decrements in lung function have been reported to persist for several days after exposure to ambient ozone concentrations less than 0.2 ppm.

One of the principal uncertainties about ozone's toxicity is the relationship between repeated exposures and chronic respiratory disease. Animal studies suggest that chronic exposure to ozone concentrations occurring in typical urban air can result in centriacinar inflammation and small airway structural changes. Recent epidemiologic evidence suggests the existence of significant associations of photochemical oxidant exposure with an accelerated decline in lung function and with symptoms of chronic respiratory disease; however, this issue has not been adequately explored.

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#### REFERENCES

- Air Quality Criteria for Ozone and Other Photochemical Oxidants (5 vols), EPA report No. 600/8-84/020 a-eF. Research Triangle Park, NC, Environmental Protection Agency, 1986
- Avol EL, Linn WS, Shamoo DA, et al: Short-term respiratory effects of photochemical oxidant exposure in exercising children. *J Air Pollut Control Assoc* 1987 Feb; 37:158-162
- Folinsbee LJ, Horstman DJ, Ives SA, et al: Pulmonary function and symptom responses after 6.6 hour exposure to 0.12 ppm ozone with moderate exercise. *J Air Pollut Control Assoc* 1988; 38:28-35

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